A.2.17 SWMU 40

Description

SWMU 40 is a former surface impoundment that was likely used to manage process and stormwater. This unit was operated prior to 1940 through approximately 1967, and possibly to 1974. An oil/water separator was used in conjunction with the Old Pond. The oil/water separator recovered oil in a rectangular box and suspended solids settled in the pond. The pond was nearly circular with a diameter of approximately 175 feet, and is depicted on Figure A.2.14. Pre-RFI sampling was conducted by DRAI within the unit in 1991. Soil samples collected in boring B-22 from 16.5 to 17.0 feet bgs contained VOCs and metals above the 1st-Phase RFI action levels.

As discussed in detail in Section 7 of the RFI Report, minor amounts of LNAPL were found at three isolated locations in SWMU 40, approximately 50 feet apart. Historically, LNAPL thickness measured in monitoring well MW-33 from trace amounts to less than 0.1 feet. However, LNAPL has not been detected at this well in over a year.

As summarized on Table A.2.14, 14 borings, 11 soil samples, one monitoring well groundwater sample and one hydropunch sample have been used to characterize this SWMU. Surface water and sediment sampling results from Transect 3, and relevant data from nearby SWMUs and AOCs are also shown on Table A.2.14 for delineation purposes. As part of the 1st-Phase-RFI, 10 soil borings were installed and one soil sample from the sump excavation was collected and analyzed for metals. During the Full RFI, 10 soil samples were collected from four borings to further characterize SWMU 40. Nine of the 10 soil samples collected were analyzed for TCL VOCs and SVOCs, and metals. One soil sample (S1334) was analyzed for TPH as part of the SWMU 40 LNAPL area characterization.

Soils

The following table summarizes the number of samples where soil delineation criteria were exceeded within SWMU 40:

Constituents of Concern	Surface Soils (0 to 2 ft) (3 Samples)	Fill Material (>2 ft) (5 Samples)	Native Soils (3 Samples)	Totals (11 Samples)
Benzene	0/3	0/3	0/3	0/9
Benzo(a)pyrene	0/3	1/3	0/3	0/9
Other SVOCs	0/3	1/3	0/3	0/9
Lead	0/3	1/4	0/3	1/10
Other TAL metals[a]	0/3	3/4	0/3	3/10

[a]Totals do not include naturally occurring metal compounds in excess of the delineation criteria (Al, Ca, Fe, Mg, Mn, K and Na.

Surface Soils (0 to 2 feet bgs)

Catalyst beads were noted in surface soils in two of the borings at SWMU 40. However, no visual staining or maximum headspace readings were observed within the surface soil. Additionally, other than naturally-occurring iron, surface soil samples submitted for analysis did not contain any VOCs, SVOCs or metals in excess of the soil delineation criteria.

Fill Materials (>2 feet bgs)

The lithologic descriptions on the boring logs indicate that visual evidence of petroleum-related impacts (e.g. staining, odors, PID readings greater than 100 ppm, etc.) in the fill material was noted frequently. Catalyst beads were also noted at depths ranging from one to 12 feet bgs. The fill layer within SWMU 40 is fairly uniform in this portion of the North Field, and ranges from approximately eight feet at several borings to 12 feet at several other locations.

As shown on the Table A.2.14, benzo(a)pyrene (12.7 mg/kg) and several COC metals, including copper (607 and 796 mg/kg), lead (486 mg/kg), nickel (327 and 453 mg/kg), and vanadium (3040 mg/kg), were detected above the applicable soil delineation criteria in the fill unit. Benzene was detected at one location (S0803F4) at 1.85 mg/kg. However, as this sample was collected from the saturated zone, the IGWSCC (1 mg/kg) is not applicable, and the concentration is below the RDCSCC for benzene (3 mg/kg). As discussed in Section 7 of the RFI Report TPH (identified as No. 2 diesel or fuel oil) was detected in sample S1334F3 at 17,000 mg/kg.

Native Material

A predominantly clay layer with a peat component underlies the fill material in this part of the Refinery. Black staining and odor were observed in the upper portion of the fill unit at S0803, but no COC exceedances were observed in a sample collected below these observations. With the exception of naturally-occurring iron no VOCs, SVOCs or metals were detected above the applicable soil delineation criteria within the native soil at SWMU 40. Therefore, the site-related soil impacts have been delineated vertically.

As discussed further in Section 6 of the RFI Report, lateral delineation of selected COCs has been completed on a site-wide basis for each Yard. The delineation of these COCs is depicted graphically on the figures provided in Section 6.

Groundwater

In 2002, monitoring well MW-126 was sampled and analyzed for VOCs, SVOCs, metals and water quality. No COCs were detected in excess of the applicable groundwater criteria. As discussed previously, minor amounts of LNAPL have been historically detected at MW-33, but LNAPL has not been measured at this location for over a year. Arsenic (31.7 µg/L) and lead (15.4J µg/L) were detected above applicable groundwater

delineation criteria in the June 2003 groundwater sample from MW0033. There were no exceedances of groundwater delineation criteria in the 2002 groundwater sample from MW-34, which is located near the separator box in the southern portion of SWMU 40. Further discussion of groundwater impacts can be found in Section 8 of the RFI Report.

Surface Water and Sediment

As part of the Full RFI, one surface water/sediment sampling transect (Transect 3) was situated in Woodbridge Creek just east of SWMU 40. As summarized on Table A.2.14, and further discussed in Section 9, a number of constituents were detected in excess of the applicable surface water and sediment screening criteria in the surface water and sediment samples as well as in the background samples. However, given that no COCs were detected above the applicable groundwater delineation criteria in the groundwater samples from the two monitoring wells located between SWMU 40 and Woodbridge Creek, it does not appear that SWMU 40 is impacting Woodbridge Creek.

Summary

Benzo(a)pyrene, several other PAHs, copper, lead, nickel and vanadium were the only COCs that were detected above the applicable soil delineation criteria in the fill unit at SWMU 40. The impacts are found entirely within the fill layer, which also exhibits widespread evidence of stained soils. As no COC exceedances were found in the native material, the site-related soil impacts are limited to subsurface fill and have been delineated vertically. Nonetheless, institutional controls and/or engineered barriers for site-related impacted soils from the uppermost native unit within SWMU 40 will be considered in the CMS.

As discussed in Section 7 of the RFI Report, the SWMU 40 LNAPL area will also be included in the CMS for further evaluation. The site-wide groundwater component of the CMS will incorporate any potential impacts in the vicinity of SWMU 40.